

Applicant thanks the Examiner for noting the incorrect Serial No at page 1, line 13 and this is corrected herein in the Specification. Further the attorney docket number has been replaced with the current application number.

Claims Objections

The recommendation of the Examiner is noted and appreciated. The change has been made to claims 1 and 3. Claims 2, 3, and 6 are canceled as being unnecessary after claims 1 and 3 are amended.

Claims Rejections under 35 USC §103

The Rejection of Claims 1-15 on Chang in view of Cusano is Overcome

Chang teaches a laminate brazing strip or foil for brazing titanium to titanium. The foil is comprised of various metals or of metal alloys laminate layers, notably copper or copper alloy, nickel or nickel alloy, titanium or titanium alloy. [col 2, lines 38-44; 61-67; col 4, lines 5-12] Chang also teaches a useful brazing strip application is 15Cu-15Ni-70Ti brazing strip which is used to braze Ti or Ti alloy components. [col 6, lines 15-17] Also, the bonding of a specific Ti alloy "Beta-21" is taught. [col 6, lines 58-64]

Further, Chang does not teach bonding stainless steel by brazing at all, nor with a laminate braze foil/strip. Chang teaches 0.040 inch thick foil 316 stainless steel being roll bonded to 0.010 inch thick foil Ni/Ti/Ni strips and further processed to yield a 0.015 inch thick foil of several 0.003 inch thick brazing layers. [col 6, lines 52-57] The resulting laminate braze material, which contains stainless steel as a laminate layer, is then placed between two sheets of 0.020 inch thick Beta-21 Ti alloy. The two sheets of Ti alloy are brazed together at 950° C for about 10 minutes by virtue of the interspersed laminate braze material. [col 6, lines 58-64]

The remaining amended Claims 1, 4, 5, 7-15 of the Application are directed to a stainless steel part and a titanium part further comprising a compact filler material of layered composite particles. One layer is comprised of nickel or nickel alloy and another is comprised of titanium or titanium alloy for bonding the stainless steel part to the titanium part.

The layered particles are not laminated foil as taught by Chang. Further, the method of calculating composition as taught by Chang [col 6, lines 6-14], is not applicable to the Application. Chang teaches that any ratio of material can be obtained by merely varying the thickness of the starting filler layers [col 7, lines 46-49] However Chang teaches that "[t]he thickness ratios of Ti to the clad materials determine the alloy composition and consequently the melting point of the alloy." [col 6, lines 7-9] This approach is not enabling, is not instructive and does not teach the invention disclosed by the Applicants.

Chang does not teach the laminated spheres of the Application. Further, Chang does not teach or suggest that bonding the dissimilar parts of stainless steel to titanium can be accomplished at all.

Bonding the dissimilar metal of stainless steel to titanium is novel over Chang and is not obvious in view of the teachings of Chang.

The Rejection of Claims 1-15 on Cusano is Overcome

Cusano teaches bonding metal to either metal or ceramic with a particulate copper oxide that is preferably mixed with an appropriate vehicle, namely where the vehicle is preferably an organic compound. [col 3, lines 20-30; col 10, lines 33-50] It is well known to those skilled in the art to apply the bonding agent in the form of foil or in the form of particulate. Cusano merely restates this teaching. Cusano also teaches that the particulate can be deposited by painting or silk screenings, which are known techniques of applying pastes and particulate as a liquid to a surface. [col 10, lines 39-40]

The Application teaches the invention that the particle is comprised of discrete layers of material, namely, a layer of nickel or a nickel alloy and a layer of titanium or a titanium alloy.

Cusano also teaches that the bond is a direct bond with no intermediate layer of solder metal or the like. [col 2, lines 32-35] The Application teaches that there is a compact filler material between the titanium and the stainless steel parts.

Given that the Application teaches a titanium part that is bonded to a stainless steel part, it is instructive that Cusano is silent on this bonded system.

Cusano teaches that "[i]t is, of course, realized by those skilled in the art that not all metals will bond to all substrates. [col 3, lines 31-32] Cusano teaches that "[h]owever, oxygen will not function as a bonding agent to bond copper to stainless steel. Sulphur will effectively function as a bonding agent between copper and stainless steel...." [col 3, lines 37-42] Cusano continues with "Nevertheless, as stated above, it is well known to those skilled in the direct bonding art that not all possible combinations of metal, substrate and bonding agent will bond. [col 3, lines 48-51] Lastly, Cusano states "[i]t should be realized that simply bringing any metal 21 and any substrate 22 together and forming a eutectic melt therebetween is not sufficient to insure bonding on cooling." [col 5, lines 29-32]

Applicant has addressed this stainless steel bonding problem and resolved it as disclosed and claimed in the Application. The novelty of the invention is reinforced by the teachings of Cusano.

The Application is non-obvious over both Chang and Cusano. Combining these references does not result in the invention disclosed by the Applicants.

Chang and Cusano Do Not Contain Any Justification to Support their Combination, Much Less in the Manner Proposed

With regard to the proposed combination of Chang and Cusano, it is well known that in order for any prior-art references themselves to be validly combined for use in a prior-art 103 rejection, the references themselves (or some other prior art) must suggest that they be combined, e.g., as was stated in In re Sernaker, 217 U.S.P.Q. 1, 6 (C.A.F.C. 1983):

"[P]rior art references in combination do not make an invention obvious unless something in the prior art references would suggest the advantage to be derived from combining their teachings."

That the suggestion to combine the references should not come from Applicant was forcefully stated in Orthopedic Equipment Co. v. United States, 217 U.S.P.Q. 193, 199 (CAFC 1983):

"It is wrong to use the patent in suit [here the patent application] as a guide through the maze of prior art references, combining the right references in the right way to achieve the result of the claims in suit [here the claims pending]. Monday morning quarterbacking is quite improper when resolving the question of nonobviousness in a court of law [here the PTO]."

As was further stated in Uniroyal, Inc. v. Rudkin-Wiley Corp., 5 U.S.P.Q.2d 1434 (C.A.F.C. 1988), "[w]here prior-art references require selective combination by the court to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gleaned from the invention itself.... Something in the prior art must suggest the desirability and thus the obviousness of making the combination." [emphasis added]

In the present case, there is no reason given in the Office Action to support the proposed combination, other than the statement "both Chang and Cusano are generally drawn to bonding metal parts through the use of bonding assisting agents." [Office action page 5, para 1] However the fact that both references teach the use of bonding assisting agents is not sufficient to gratuitously and selectively substitute parts of one reference for a part of another reference in order to meet Applicants' novel claimed combination.

The Application presents novel results that are neither anticipated nor disclosed by either Chang or Cusano alone or in combination. Based on Chang and Cusano, the results of the Application are unexpected and are not a mere design choice.

Parent Application Number 10/821,023 is Disqualified as Prior Art

The parent Application is disqualified as prior art under 35 USC 103(c) since the subject matter were owned by the same person at the time of the invention.

Application 10/823,963 (attorney docket A369-CIP) and its parent Application 10/821,023 (attorney docket A369-USA) were, at the time the invention of Application 10/823,963 was made, owned by the Alfred E. Mann Foundation for Scientific Research.